Parasitology Bench Sheet/Prelim/Final Info

26939 -- 001

Nec Order Date: 1/21/2016 Staff Pathologist: Susan Knowles

Case Pathologist: Susan Knowles DPL#: 16-009

Family: Fringillidae Genus / Species: *Pinicola enucleator* Fund Code: Base

Common Name: Grosbeak, Pine TSN: 179205

County Collected: Yukon - Koyukuk StateColl: AK Site:

Submission Comment: Condition: Thawed

Crow Creek written on carcass bag. Comment from AK Dept of Fish and Game sub form: "Brought to office by local resident who found the specimen dead on her porch- suspected window strike. Live birds with similar condition have been seen elsewhere in Galena. Above average numbers of PIGR in the area this winter."

Submitted: **Other tissue** Leg, previously frozen

Gen Cocci Crypto Knotts Myxozoa Nec Tech: KG

☑ ☐ ☐ ☐ ☐

PX 688 3/28/17 8 mites from xylene vial for DNA extraction. and
PX 687 8 mites from 100% molecular for DNA Extraction.
- due to power failure redoing extactions w/ new mites as follows
PX694 4/3/2017 10 mites
PX695 4/2/2017 5 mites fr vial w/ red dot
~~PX 703 4/30/2017 8 mites for DNA extraction.~~

Special Instructions from Pathologist:

Procedures Performed/Identification/Information/Date/Initials:

KNEMIDOCOPTES sp. mites were seen in the skin scraping from the foot of Pine Grosbeak 1-21-16 SG no sample saved

Leg was ~~removed from freezer~~ placed in freezer 1-22-16 SG

6.10.16: Leg not found in freezer. 2nd Leg Submitted from Necro. -km

6/27/16 Removed fr freezer, placed in 5% KOH placed in hot water bath at 37°-40°c. for 24 hrs

6/28/16 Removed mites rinsed in 100% etoh → xylene → 100% ~~Hexs~~

1 vial w/ 100+ mites 1 vial w/ 28+ mites by DC

1 vial into 100% etoh molec # 38 by DC

FOR methods: 1992 Clayton + Moore P 11 → see pdf attach 3 vials

TR=Total Recovered DC=Direct Count E=Estimate A=Aliquot

Photos Y/N?: N Photos Linked inDB?: N/A Specimens Saved? ☒ Yes (see back) 3 vials 6/2016 ☐ No ~~Clayton~~ Freezer?

x PDF Date: 1-21-16

PARA Final: ✓

NWHC Final: ✓

Parasitologist: Skeja Sleiner Date: 1-21-16

By: SG

NO saved tissue specimens

x re pdf's 7-13-2016

3 vials of mites

Printed: 1/21/2016 11:12:07 AM

stainless steel screen, and the exoskeletons are rinsed first with 95% alcohol, then with xylene to dissolve any fat remaining from the host's skin. Next the specimens are washed into a gridded Petri dish with 95% alcohol and stained with acid fuchsin for counting under a dissecting microscope. Adult arthropods collected by this method are often in good enough shape to be identified by taxonomists after mounting on microslides (but immature stages are often badly damaged).

Tests of this technique (Clayton 1991), using known numbers of adult lice added to clean feathers, showed a mean recovery of 95% (range = 91-100%). However, the mean recovery of nymphal lice was only 82% (76-93%), which accords with the findings of other workers who found few nymphs (Ash 1960; Lemke *et al.* 1988). Hence, the method is not as reliable for immature stages as for adults, because nymphal instars apparently lack sufficient chitin or pass through the screen during filtration.

As in the case of washing, it is possible to use methods other than filtration for isolating ectoparasites following dissolution. Hilton (1970) suggested allowing hot KOH solution to stand for 12 hours until the ectoparasites and other fine particles had settled to the bottom of the beaker. The supernatant can then be decanted and the sediment transferred to a tube where it is centrifuged at 1200 r.p.m. After decanting again, the tube is filled with a zinc sulfate solution (386 g $ZnSO_4$ in 1.0 litre of water, specific gravity = 1.18), and the mixture is again centrifuged for five minutes. This procedure causes the ectoparasites to float on the surface of the solution, from which they may be decanted or aspirated into a Petri dish and counted under a dissecting microscope. The disadvantage of this approach is that, with so many additional steps, the probability of losing ectoparasites increases, unless one is very careful. Diligent checking of the supernatants and final sediment under a dissecting microscope are essential to prevent losses.

Dissolution can be used to collect parasite microhabitat data by dividing the skin of the host into regions which are then incubated and dissolved in separate beakers. Choe and Kim (1988) used this approach to plot the microhabitat distributions of ticks, mites, and lice on the bodies of seabirds.

The principle drawback of dissolution is that, like body washing, it can only be used with dead birds that are not needed for museum specimens, although skeletons can be saved. Dissolution is also a relatively slow procedure and has an offensive smell (to put it mildy). The boiling step must be performed under a fume hood, as KOH fumes are toxic.

PRESERVED BIRDS

Foster (1969*b*) studied the demographics of warbler lice by counting unhatched louse eggs on museum skins. This approach could be useful for other groups of permanent parasites, like feather mites. Museum skins are also a source of dried lice for taxonomic study (Ward 1957). One must be cautious, however, to avoid erroneous host records, because skins are routinely moved from drawer to drawer as collections expand. It is conceivable that louse intensity might be estimated from dried lice on bird skins, assuming the skins have been collected and prepared in the same way.

Fluid-preserved birds are also a useful source of ectoparasites, so long as they have been isolated from other birds when collected, as described earlier. Indeed, fluid-preserved specimens are one of the best sources of ectoparasites like skin mites, which are difficult to collect, much less quantify, under field conditions.

Intranasal washing

In this procedure, the nasal cavity of a dead bird is flushed with a fine stream of water from a hypodermic syringe or bulbed pipette. The method, originally devised for mammals (Yunker 1961), is rapid and provides good returns from birds (Wilson 1964). Wilson (1964) reported that visual examination, in conjunction with necropsy of the nasal passages, yielded higher prevalences of nasal mites than intranasal washing. However, the prevalences he reported from the two approaches are not significantly different [mites detected in 32 of 89 (36%) dissected birds and 62 of 200 (31%) washed birds; $\chi^2 = 0.69$, $P = 0.41$]. Spicer (1984) used intranasal washing to collect nasal mites from a large number of tropical bird species. The method also can be used on fluid-preserved museum specimens.

Body washing

This is an efficient technique, but one that can only be used on birds that are to be preserved in alcohol, skeletonized, or discarded (Watson and Amerson 1967). The ectoparasites are removed by shaking the bird in a plastic jar or tin containing a 1-2% solution of detergent or soap. The soap serves merely as a wetting agent and must be used in small quantity to prevent excessive foaming. The brand of soap is not critical; good results have been obtained with Cold Water All® (Henry and McKeever 1971), Alconox® (McGroarty and Dobson 1974) and Palmolive Dishwashing Liquid® (Wicht and Crossley 1983). Optimal results are obtained by shaking the immersed host on a paint shaker or other mechanical shaker for 5-10 minutes. After reducing the surface tension and foam with a stream of 95% alcohol, the solution is filtered through an 80 mesh (0.180 mm) screen or filter paper. The latter normally requires several changes of paper, particularly in the case of birds with soiled plumage. Vacuum filtration with a Buchner funnel (Krantz 1978) can speed the process, or one can try methods such as sedimentation, flotation, and/or centrifugation (see sections on Dissolution and Nests).

Henry and McKeever (1971) removed > 90% of mites, fleas and lice from rats using the washing technique and a paint shaker. However, only 66% of ticks were removed, the others presumably remaining attached to the host. Lipovsky (1951) refrigerated hosts for 24 hours, then warmed them to room temperature to encourage chiggers to detach before washing. McGroarty and Dobson (1974) removed > 95% of lice and > 85% of feather mites from house sparrows using the washing method and a paint shaker.

Clayton (unpublished data) used a simple form of body washing to collect lice and mites from freshly killed birds subsequently prepared as museum skeletal specimens. Each freshly killed bird was immersed in alcohol in a medical Whirlpack® bag, shaken vigorously for 60 seconds, then rinsed with a stream of alcohol as it was removed from the bag. The bags were rolled shut and transported back to the laboratory for examination.

Dissolution

This approach is like burning down a haystack to find its needles. The feathers and skin of the host are completely dissolved in potassium hydroxide (KOH), leaving behind the exoskeletons of arthropods, which are made of chitinous carbohydrates that do not dissolve. The following protocol is a combination of steps from Choe and Kim (1987), Lemke *et al.* (1988) and Clayton (1991).

The dead bird is carefully skinned, and the skin with attached plumage is incubated at 37-38°C for 24 hours in a beaker containing 0.5% trypsin (4 x USP Pancreatin) buffered to pH 7.5-8.3 with 0.2 M disodium phosphate (Na_2HPO_4). Following incubation, KOH is added to a concentration of 5.0%. The solution is then boiled on a hot plate until both skin and feathers are dissolved. The hot solution is filtered through an 80 mesh (0.180 mm) bronze or

26939-1
PX688
mite
Seq Contig 3,4

BLAST® » blastn suite » RID-EZPPB2EP016

BLAST Results

Job title: px688_26939-001_Contig_pa819_seq3_4_MiteCOIpcr 4_7_2017 SEQMAN edited 04_13_2017clr

RID EZPPB2EP016 (Expires on 04-15 04:08 am)
Query ID lcl|Query_134587
Description None
Molecule type nucleic acid
Query Length 678

Database Name nr
Description Nucleotide collection (nt)
Program BLASTN 2.6.0+

Descriptions

Sequences producing significant alignments:

Description	Max score	Total score	Query cover	E value	Ident	Accession
Knemidokoptes jamaicensis voucher AMUEnv431 cytochrome c oxidase subunit I (COI) gene, partial cds; mitochondrial	723	723	91%	0.0	88%	gi|403116914|JQ037816.1
Knemidokoptes sp. NS-2014 cytochrome c oxidase subunit I (COI) gene, partial cds; mitochondrial	695	695	91%	0.0	87%	gi|669687872|KJ787640.1
Bychovskiata vociferi voucher UMMZ BMOC 06-1207-002 AD778 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	510	510	97%	2e-140	81%	gi|1063545514|KU203078.1
Promeginia calonectris voucher ZISP 6037 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	490	490	87%	2e-134	82%	gi|725007772|KM401843.1
Promeginia calonectris voucher ZISP 6035 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	484	484	87%	9e-133	81%	gi|725007770|KM401842.1
Promeginia calonectris voucher ZISP 6034 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	484	484	87%	9e-133	81%	gi|725007768|KM401841.1
Promeginia calonectris voucher ZISP 6036 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	479	479	87%	4e-131	81%	gi|725007766|KM401840.1
Promeginia calonectris voucher ZISP 6038 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	473	473	87%	2e-129	81%	gi|725007764|KM401839.1
Scutulanyssus obscurus voucher UMMZ BMOC 06-0612-026 AD676 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	462	462	97%	4e-126	79%	gi|1063545536|KU203089.1
Scutulanyssus obscurus voucher 780_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	462	462	88%	4e-126	81%	gi|756141963|KP193763.1
Scutulanyssus hirundicola voucher 771_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	462	462	88%	4e-126	81%	gi|756141959|KP193761.1
Proctophyllodes attenuatus voucher UMMZ BMOC 08-0515-104 AD1175 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	460	460	95%	2e-125	79%	gi|1063545638|KU203140.1
Otodectes cynotis isolate AD466 cytochrome oxidase subunit I (COXI) gene, partial cds; mitochondrial	460	460	97%	2e-125	80%	gi|586973048|KF891933.1
Syringobia longipenis cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	455	455	82%	7e-124	81%	gi|284176636|GQ864349.1
Myocoptes musculinus isolate MIT_Myoc1 cytochrome c oxidase subunit I (COX1) gene, complete cds; mitochondrial	451	451	99%	1e-122	79%	gi|982894447|KT384407.1
Promeginia bulweriae voucher ZISP 6033 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	451	451	87%	1e-122	80%	gi|725007774|KM401844.1
Xynonodectes sp. UMMZ BMOC 08-0515-156 AD1213 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	449	449	97%	3e-122	79%	gi|1063545822|KU203232.1
Proctophyllodes pheuctici voucher UMMZ BMOC 07-0626-001 AD923 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	449	449	95%	3e-122	79%	gi|1063545674|KU203158.1
Otodectes cynotis isolate cat-3 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	93%	2e-119	79%	gi|932245966|KP676680.1
Otodectes cynotis isolate cat-2 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	93%	2e-119	79%	gi|932245964|KP676679.1
Otodectes cynotis isolate cat-1 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	93%	2e-119	79%	gi|932245962|KP676678.1
Otodectes cynotis isolate dog-5 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	93%	1e-117	79%	gi|932245991|KP676687.1
Otodectes cynotis isolate dog-4 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	93%	1e-117	79%	gi|932245989|KP676686.1
Otodectes cynotis isolate dog-1 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	93%	1e-117	79%	gi|932245983|KP676683.1
Otodectes cynotis isolate cat-5 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	93%	1e-117	79%	gi|932245970|KP676682.1
Pteronyssoides motacillae voucher 152_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	435	435	88%	1e-117	80%	gi|756141945|KP193754.1
Nycteridocaulus aff. lamellus UMMZ BMOC 08-0515-158 AD1212 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	433	433	97%	3e-117	79%	gi|1063545780|KU203211.1

BLAST ® » blastn suite » RID-F9VHF84M013

26939-001
PX 694
rerun of Seq 5 by UW
Reanalysed rerun 5+6 seq's 4/17/2017
Mite

BLAST Results

Job title: px694_26939-001_Contig_pa820_seq5rerun_6_MiteCOIpcr 4_7_2017 SEQMAN edited 04_17_2017clr

RID F9VHF84M013 (Expires on 04-19 00:32 am)

Query ID lcl|Query_196755
Description None
Molecule type nucleic acid
Query Length 671

Database Name nr
Description Nucleotide collection (nt)
Program BLASTN 2.6.0+

Descriptions

Sequences producing significant alignments:

Description	Max score	Total score	Query cover	E value	Ident	Accession
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Bychovskiata vociferi voucher UMMZ BMOC 06-1207-002 AD778 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	510	510	98%	2e-140	81%	gi|1063545514|KU203078.1
Promegninia calonectris voucher ZISP 6037 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	490	490	88%	2e-134	82%	gi|725007772|KM401843.1
Promegninia calonectris voucher ZISP 6035 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	484	484	88%	9e-133	81%	gi|725007770|KM401842.1
Promegninia calonectris voucher ZISP 6034 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	484	484	88%	9e-133	81%	gi|725007768|KM401841.1
Promegninia calonectris voucher ZISP 6036 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	479	479	88%	4e-131	81%	gi|725007766|KM401840.1
Promegninia calonectris voucher ZISP 6038 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	473	473	88%	2e-129	81%	gi|725007764|KM401839.1
Scutulanyssus obscurus voucher UMMZ BMOC 06-0612-026 AD676 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	462	462	98%	4e-126	79%	gi|1063545536|KU203089.1
Scutulanyssus obscurus voucher 780_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	462	462	89%	4e-126	81%	gi|756141963|KP193763.1
Scutulanyssus hirundicola voucher 771_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	462	462	89%	4e-126	81%	gi|756141959|KP193761.1
Proctophyllodes attenuatus voucher UMMZ BMOC 08-0515-104 AD1175 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	460	460	96%	2e-125	79%	gi|1063545638|KU203140.1
Otodectes cynotis isolate AD466 cytochrome oxidase subunit I (COXI) gene, partial cds; mitochondrial	460	460	98%	2e-125	80%	gi|586973048|KF891933.1
Syringobia longipenis cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	455	455	83%	7e-124	81%	gi|284176636|GQ864349.1
Myocoptes musculinus isolate MIT_Myoc1 cytochrome c oxidase subunit I (COX1) gene, complete cds; mitochondrial	451	451	99%	1e-122	79%	gi|982894447|KT384407.1
Promegninia bulweriae voucher ZISP 6033 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	451	451	88%	1e-122	80%	gi|725007774|KM401844.1
Xynonodectes sp. UMMZ BMOC 08-0515-156 AD1213 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	449	449	98%	3e-122	79%	gi|1063545822|KU203232.1
Proctophyllodes pheuctici voucher UMMZ BMOC 07-0626-001 AD923 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	449	449	96%	3e-122	79%	gi|1063545674|KU203158.1
Otodectes cynotis isolate cat-3 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	94%	2e-119	79%	gi|932245966|KP676680.1
Otodectes cynotis isolate cat-2 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	94%	2e-119	79%	gi|932245964|KP676679.1
Otodectes cynotis isolate cat-1 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	94%	2e-119	79%	gi|932245962|KP676678.1
Otodectes cynotis isolate dog-5 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	94%	1e-117	79%	gi|932245991|KP676687.1
Otodectes cynotis isolate dog-4 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	94%	1e-117	79%	gi|932245989|KP676686.1
Otodectes cynotis isolate dog-1 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	94%	1e-117	79%	gi|932245983|KP676683.1
Otodectes cynotis isolate cat-5 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	94%	1e-117	79%	gi|932245970|KP676682.1
Pteronyssoides motacillae voucher 152_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	435	435	89%	1e-117	80%	gi|756141945|KP193754.1
Nycteridocaulus aff. lamellus UMMZ BMOC 08-0515-158 AD1212 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	433	433	98%	3e-117	79%	gi|1063545780|KU203211.1
Otodectes cynotis isolate dog-6 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	429	429	94%	4e-116	79%	gi|932245993|KP676688.1
Otodectes cynotis isolate dog-3 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	429	429	94%	4e-116	79%	gi|932245987|KP676685.1

UW reran Seq 5 , reanalyzed and inserted page above this original seq blast result.

26939-1
PV 694
mite

This seq contig for 5+6 has an "R" base, FYI

BLAST® » blastn suite » RID-EZRWV7D9016

BLAST Results

Job title: px694_26939-001_Contig_pa820_seq5_6_MiteCOIpcr 4_7_2017 SEQMAN edited 04_13_2017clr

RID EZRWV7D9016 (Expires on 04-15 04:29 am)
Query ID lcl|Query_55763
Description None
Molecule type nucleic acid
Query Length 607

Database Name nr
Description Nucleotide collection (nt)
Program BLASTN 2.6.0+

Descriptions

Sequences producing significant alignments:

Description	Max score	Total score	Query cover	E value	Ident	Accession
Knemidokoptes jamaicensis voucher AMUEnv431 cytochrome c oxidase subunit I (COI) gene, partial cds; mitochondrial	625	625	91%	5e-175	87%	gi|403116914|JQ037816.1
Knemidokoptes sp. NS-2014 cytochrome c oxidase subunit I (COI) gene, partial cds; mitochondrial	604	604	91%	6e-169	86%	gi|669687872|KJ787640.1
Scutulanyssus obscurus voucher 780_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	451	451	97%	9e-123	81%	gi|756141963|KP193763.1
Bychovskiata vociferi voucher UMMZ BMOC 06-1207-002 AD778 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	449	449	98%	3e-122	80%	gi|1063545514|KU203078.1
Scutulanyssus hirundicola voucher 771_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	442	442	97%	5e-120	80%	gi|756141959|KP193761.1
Syringobia longipenis cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	87%	2e-119	82%	gi|284176636|GQ864349.1
Promegninia calonectris voucher ZISP 6037 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	422	422	87%	7e-114	81%	gi|725007772|KM401843.1
Promegninia calonectris voucher ZISP 6035 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	422	422	87%	7e-114	81%	gi|725007770|KM401842.1
Promegninia calonectris voucher ZISP 6034 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	422	422	87%	7e-114	81%	gi|725007768|KM401841.1
Promegninia calonectris voucher ZISP 6036 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	416	416	87%	3e-112	81%	gi|725007766|KM401840.1
Pteronyssoides motacillae voucher 152_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	414	414	97%	1e-111	79%	gi|756141945|KP193754.1
Schizocarpus sp. AMUChi01 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	414	414	87%	1e-111	81%	gi|284176626|GQ864344.1
Promegninia calonectris voucher ZISP 6038 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	411	411	87%	1e-110	81%	gi|725007764|KM401839.1
Trouessartia ripariae voucher 848_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	407	407	97%	2e-109	79%	gi|756142025|KP193794.1
Otodectes cynotis isolate AD466 cytochrome oxidase subunit I (COXI) gene, partial cds; mitochondrial	405	405	98%	7e-109	79%	gi|586973048|KF891933.1
Scutulanyssus obscurus voucher UMMZ BMOC 06-0612-026 AD676 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	399	399	98%	3e-107	79%	gi|1063545536|KU203089.1
Proctophyllodes attenuatus voucher UMMZ BMOC 08-0515-104 AD1175 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	396	396	98%	4e-106	79%	gi|1063545638|KU203140.1
Trouessartia ripariae voucher 850_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	396	396	97%	4e-106	79%	gi|756142021|KP193792.1
Myocoptes musculinus isolate MIT_Myoc1 cytochrome c oxidase subunit I (COX1) gene, complete cds; mitochondrial	394	394	99%	1e-105	78%	gi|982894447|KT384407.1
Trouessartia ripariae voucher 849_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	390	390	97%	2e-104	79%	gi|756142023|KP193793.1
Otodectes cynotis isolate cat-3 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	388	388	87%	7e-104	80%	gi|932245966|KP676680.1
Otodectes cynotis isolate cat-2 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	388	388	87%	7e-104	80%	gi|932245964|KP676679.1
Otodectes cynotis isolate cat-1 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	388	388	87%	7e-104	80%	gi|932245962|KP676678.1
Myocoptidae sp. AMUMyo01 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	388	388	84%	7e-104	81%	gi|284176620|GQ864341.1
Proctophyllodes pheuctici voucher UMMZ BMOC 07-0626-001 AD923 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	387	387	98%	2e-103	78%	gi|1063545674|KU203158.1
Trouessartia sp. UMMZ BMOC 03-0831-023 AD616 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	387	387	98%	2e-103	79%	gi|1063545556|KU203099.1
Trouessartia swidwiensis voucher 366_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	387	387	97%	2e-103	79%	gi|756142063|KP193813.1

26939-1
PX 695
mite
Seq 7,8 Contig

BLAST® » blastn suite » RID-EZSZVC37013

BLAST Results

Job title: px695_26939-001_Contig_pa820_seq7_8_MiteCOIpcr 4_7_2017 SEQMAN edited 04_13_2017clr

RID EZSZVC37013 (Expires on 04-15 04:47 am)
Query ID lcl|Query_39477
Description None
Molecule type nucleic acid
Query Length 669

Database Name nr
Description Nucleotide collection (nt)
Program BLASTN 2.6.0+

Descriptions

Sequences producing significant alignments:

Description	Max score	Total score	Query cover	E value	Ident	Accession
Knemidokoptes jamaicensis voucher AMUEnv431 cytochrome c oxidase subunit I (COI) gene, partial cds; mitochondrial	723	723	92%	0.0	88%	gi|403116914|JQ037816.1
Knemidokoptes sp. NS-2014 cytochrome c oxidase subunit I (COI) gene, partial cds; mitochondrial	695	695	92%	0.0	87%	gi|669687872|KJ787640.1
Bychovskiata vociferi voucher UMMZ BMOC 06-1207-002 AD778 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	510	510	98%	2e-140	81%	gi|1063545514|KU203078.1
Promegninia calonectris voucher ZISP 6037 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	490	490	88%	2e-134	82%	gi|725007772|KM401843.1
Promegninia calonectris voucher ZISP 6035 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	484	484	88%	9e-133	81%	gi|725007770|KM401842.1
Promegninia calonectris voucher ZISP 6034 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	484	484	88%	9e-133	81%	gi|725007768|KM401841.1
Promegninia calonectris voucher ZISP 6036 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	479	479	88%	4e-131	81%	gi|725007766|KM401840.1
Promegninia calonectris voucher ZISP 6038 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	473	473	88%	2e-129	81%	gi|725007764|KM401839.1
Scutulanyssus obscurus voucher UMMZ BMOC 06-0612-026 AD676 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	462	462	98%	4e-126	79%	gi|1063545536|KU203089.1
Scutulanyssus obscurus voucher 780_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	462	462	89%	4e-126	81%	gi|756141963|KP193763.1
Scutulanyssus hirundicola voucher 771_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	462	462	89%	4e-126	81%	gi|756141959|KP193761.1
Proctophyllodes attenuatus voucher UMMZ BMOC 08-0515-104 AD1175 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	460	460	97%	2e-125	79%	gi|1063545638|KU203140.1
Otodectes cynotis isolate AD466 cytochrome oxidase subunit I (COXI) gene, partial cds; mitochondrial	460	460	98%	2e-125	80%	gi|586973048|KF891933.1
Syringobia longipenis cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	455	455	83%	7e-124	81%	gi|284176636|GQ864349.1
Promegninia bulweriae voucher ZISP 6033 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	451	451	88%	1e-122	80%	gi|725007774|KM401844.1
Xynonodectes sp. UMMZ BMOC 08-0515-156 AD1213 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	449	449	98%	3e-122	79%	gi|1063545822|KU203232.1
Proctophyllodes pheuctici voucher UMMZ BMOC 07-0626-001 AD923 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	449	449	97%	3e-122	79%	gi|1063545674|KU203158.1
Myocoptes musculinus isolate MIT_Myoc1 cytochrome c oxidase subunit I (COX1) gene, complete cds; mitochondrial	449	449	100%	3e-122	79%	gi|982894447|KT384407.1
Otodectes cynotis isolate cat-3 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	95%	2e-119	79%	gi|932245966|KP676680.1
Otodectes cynotis isolate cat-2 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	95%	2e-119	79%	gi|932245964|KP676679.1
Otodectes cynotis isolate cat-1 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	440	440	95%	2e-119	79%	gi|932245962|KP676678.1
Otodectes cynotis isolate dog-5 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	95%	1e-117	79%	gi|932245991|KP676687.1
Otodectes cynotis isolate dog-4 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	95%	1e-117	79%	gi|932245989|KP676686.1
Otodectes cynotis isolate dog-1 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	95%	1e-117	79%	gi|932245983|KP676683.1
Otodectes cynotis isolate cat-5 cytochrome oxidase subunit I (COI) gene, partial cds; mitochondrial	435	435	95%	1e-117	79%	gi|932245970|KP676682.1
Pteronyssoides motacillae voucher 152_C cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	435	435	89%	1e-117	80%	gi|756141945|KP193754.1
Nycteridocaulus aff. lamellus UMMZ BMOC 08-0515-158 AD1212 cytochrome oxidase subunit I (COX1) gene, partial cds; mitochondrial	433	433	98%	3e-117	79%	gi|1063545780|KU203211.1